Seamless Learning Support

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#SURF #Context #CELSTEC #OpenUniversiteit #TEL #Seamless #Learning

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Mobile Learning Research Lines

#1 Mobile and ubiquitous learning content
Ubiquitous access to learning support and distributed multi-format learning content.

– Mobile Video and Audio Content (**Youtube EDU, iTunes U**), Cloud-based learning content, Mobile data collection and aggregation (**weSPOT**), eBooks and tablet content (RW).

#2 Orchestration of seamless learning support
Instructional design of nomadic and seamless learning support.

– Ubiquitous LMS access, Mixed Reality Games (**ARLearn**), Excursions and Field Trip systems, Mobile Augmented Reality, Mobile Learning Games, Object and location-based service access.

#3 Situated learning experiences
Connect the Learning and the real World, context-aware learning systems, sensor-based learning support.

– Experience sampling apps, Sensor-based learning apps, Situated and ambient displays, Context-aware social media, Tangible and smart-objects for learning

Mobile Learning Application Domains

- **eHealth and healthcare**
  EMURGENCY: performance support and notification system, Handover procedures, Reference apps for daily practice
- **Science Learning.** *weSPOT:* Inquiry Based Learning
- **Law and Management education**
  OpenScout, OUNL iPad pilots, *UNHCR* mobile simulated games
- **Architecture and creative industries**
  MACE location-based content and social media, Cloud-based cooperation methods in design and architecture
- **Cultural Heritage**
  Mixed reality field trips with Cultural Sciences, CW
- **Logistics**
  SALOMO: Situation Awareness and Mobile data collection
- **Language learning**
  ELENA, PhD projects
- **Teacher education and networking**
  mobile social networking apps, *LOOK NiB*.

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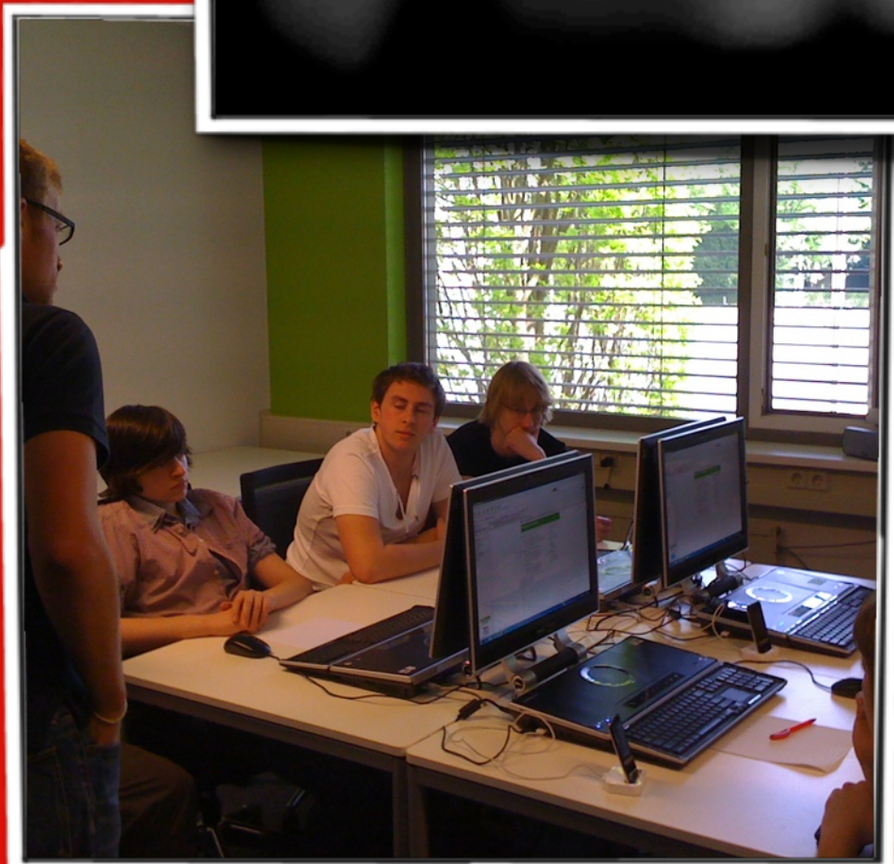
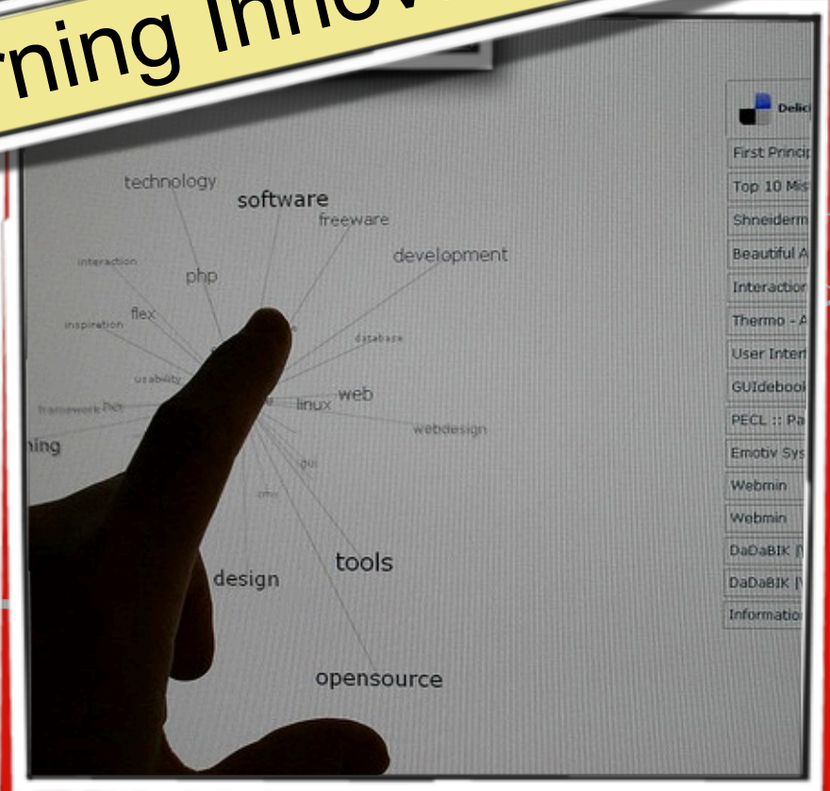
New media for learning and professional development

Learning Innovation Lab





#mobilelearning #Seamless #challenges

Seams (Wong et al, 2009)

- (MSL1) Formal and informal learning;
- (MSL2) Personalized and social learning;
- (MSL3) Across time;
- (MSL4) Across locations;
- (MSL5) Ubiquitous information access;
- (MSL6) Physical and digital worlds;
- (MSL7) Combined use of multiple device types;

Marcus

@Home

- Plan Trip: Info into Evernote
- Alarm Clock
- Shower
- CoffeeMachine
- Tablet GoodReader
- MobileApp: Check Train Schedule
- Pack Stuff

@Utrecht Centraal

- MobileApp: NS
- BigScreen: Board
- AudioDisplay: Anouncement
- How to get to Maarssen?
- Access Evernote

@Train

- MacBook
- Keynote: Creating Slides
- Music: Fat Freddy
- Mobile: WhatsApp

@Maarssen

- VGA Adapter
- Keynote: Show Presentation
- Remote Control
- Talk, Distraction Off
- Take Minutes in Sessions

Time, Locations, Social Context

Seams (Wong et al, 2009)

- (MSL8) Switching between multiple learning tasks (data collection + analysis)
- (MSL9) Knowledge synthesis
- (MSL10) Encompassing multiple pedagogical or learning activity models.

#mobilelearning
#ContextAwareComputing
what is #context

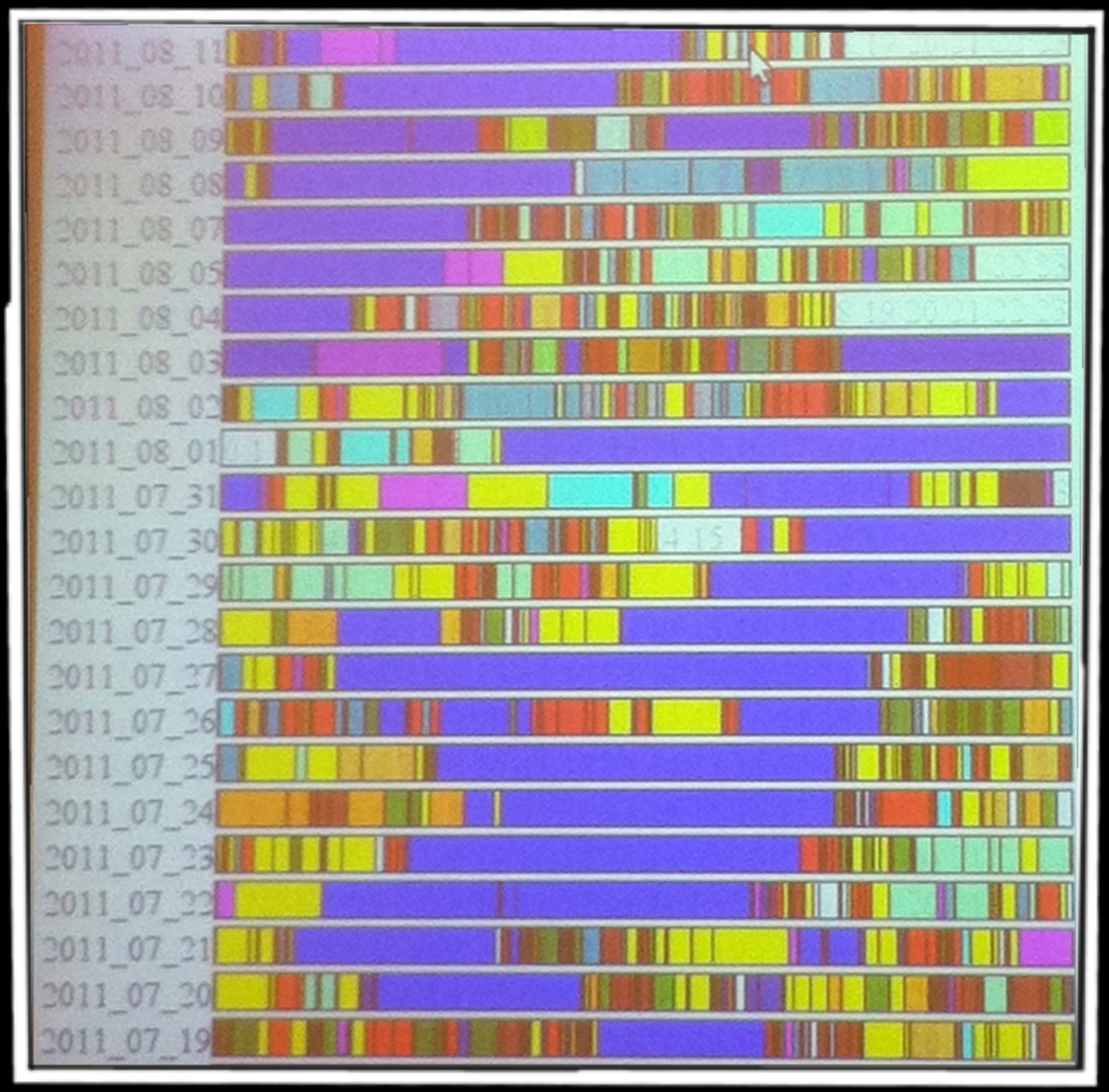
context is dynamic ...

context is social ...

context is connecting ...

engineering challenge:
what are the
opportunities for
technology to enhance
learning in context ?

#sensor technology can record data in a scalable way.



http://quantifiedself.com/

#cloud technology can support seamless learning trajectories.

disappearing

Wong, L.-H., & Looi, C.-K. (2011). What Seams Do We Remove in Mobile Assisted Seamless Learning? A Critical Review of the Literature. *Computers & Education*, *57*(4), 2364-2381. Elsevier Ltd. doi:10.1016/j.compedu.2011.06.007

#AR technology can augment your perception of a context ...

http://www.designbynotion.com/metamirror-next-generation-tv/

#display technology can create feedback loops ...

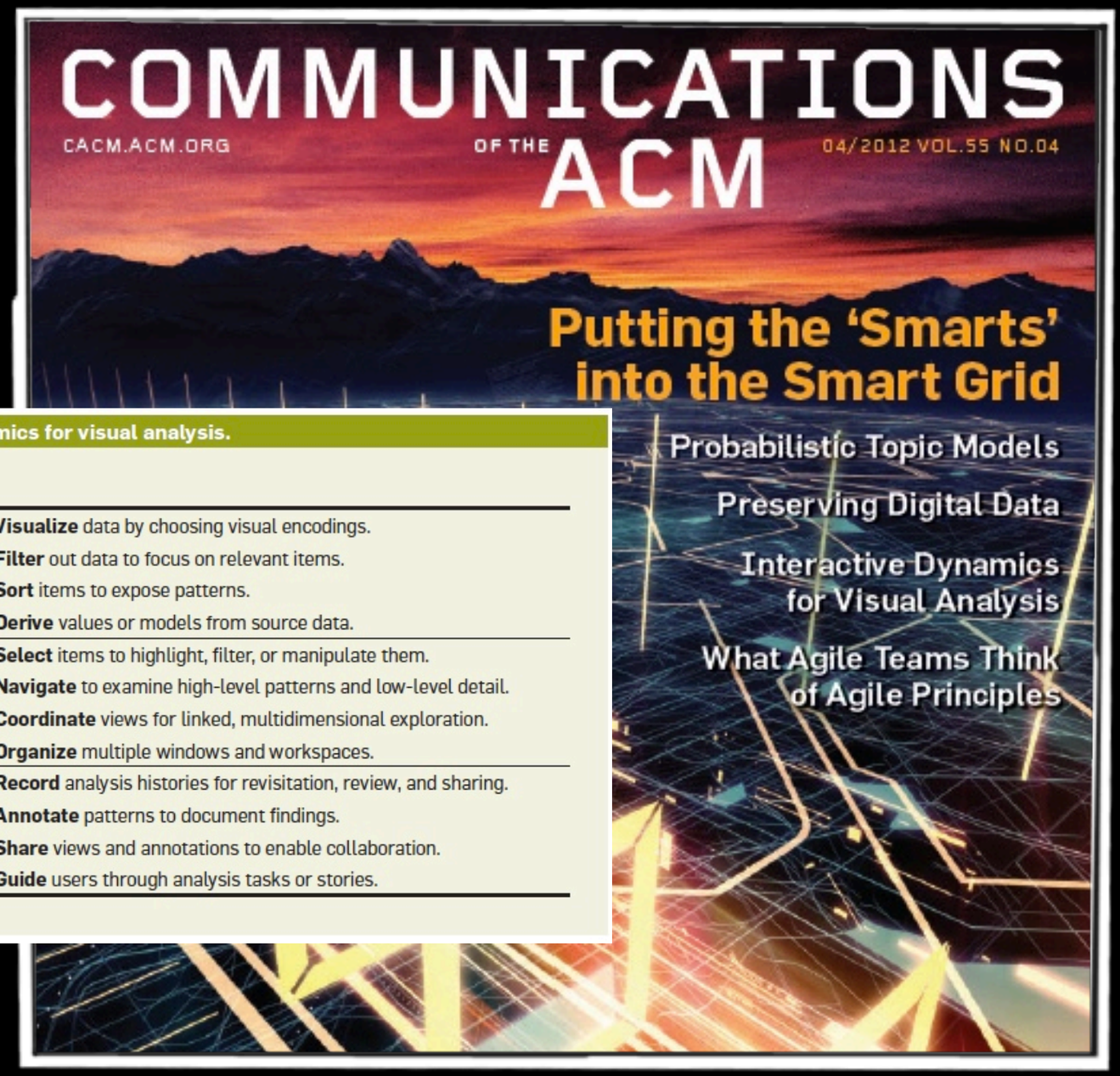
Goetz, T. (2011). Harnessing the Power of Feedback Loops | Magazine. *wired.com*. Retrieved August 22, 2011, from http://www.wired.com/magazine/2011/06/ff_feedbackloop/5/

#display tech. can support awareness and reflection.

Fig. 1. The current prototype of *Reflect*

Bachour, K., Kaplan, F., & Dillenbourg, P. (2008). Reflect : An Interactive Table for Regulating Face-to-Face Collaborative Learning. *Technology*, 39-48. Retrieved from http://dx.doi.org/10.1007/978-3-540-87605-2_5

#visualisation and LA can support personal sense making.



DOI:10.1145/2133806.2133821

Article development led by acmqueue
queue.acm.org

A taxonomy of tools that support the fluent and flexible use of visualizations.

BY JEFFREY HEER AND BEN SHNEIDERMAN

Interactive Dynamics for Visual Analysis

Taxonomy of interactive dynamics for visual analysis.

Data and View Specification	**Visualize** data by choosing visual encodings.
	Filter out data to focus on relevant items.
	Sort items to expose patterns.
	Derive values or models from source data.
View Manipulation	**Select** items to highlight, filter, or manipulate them.
	Navigate to examine high-level patterns and low-level detail.
	Coordinate views for linked, multidimensional exploration.
	Organize multiple windows and workspaces.
Process and Provenance	**Record** analysis histories for revisitation, review, and sharing.
	Annotate patterns to document findings.
	Share views and annotations to enable collaboration.
	Guide users through analysis tasks or stories.

Heer, J., Shneiderman, B. (2012). Interactive Dynamics for Visual Analysis. Communications of the ACM. Vol 55. No 04. pp. 45-54.

#research #context #CELSTEC
#seams #aggregation #ubiquitous

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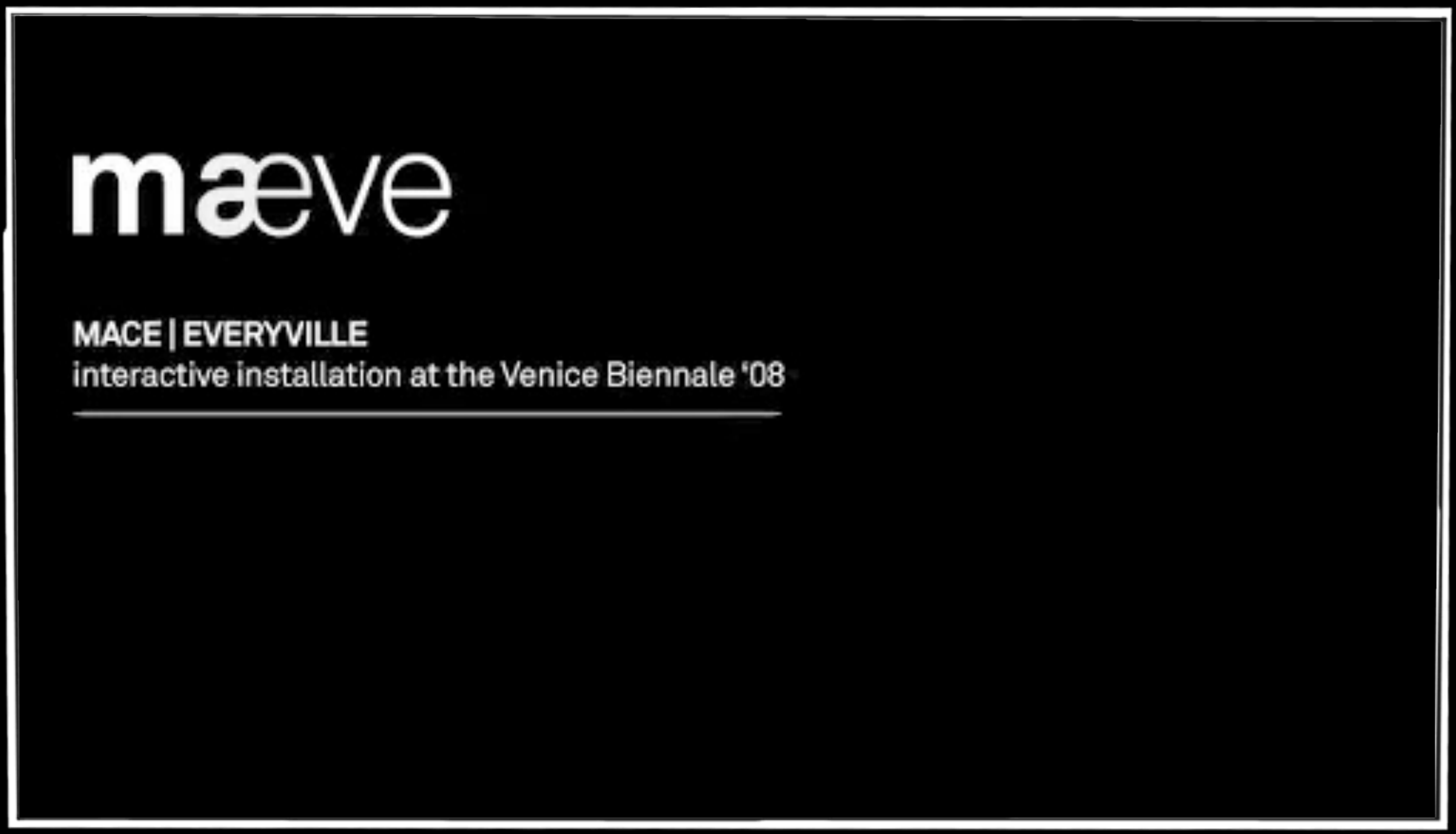
Personal Context Notifications

Figure 8.2. Student reflective practice a. Daily SMS received by students. b. What were your main learning channels today? c. How intense was your learning day? Rate it from 1 to 5.

Personal/Social Aggregation Displays

Task Aggregation of Data Collectors

Augmentation of Collaboration Context

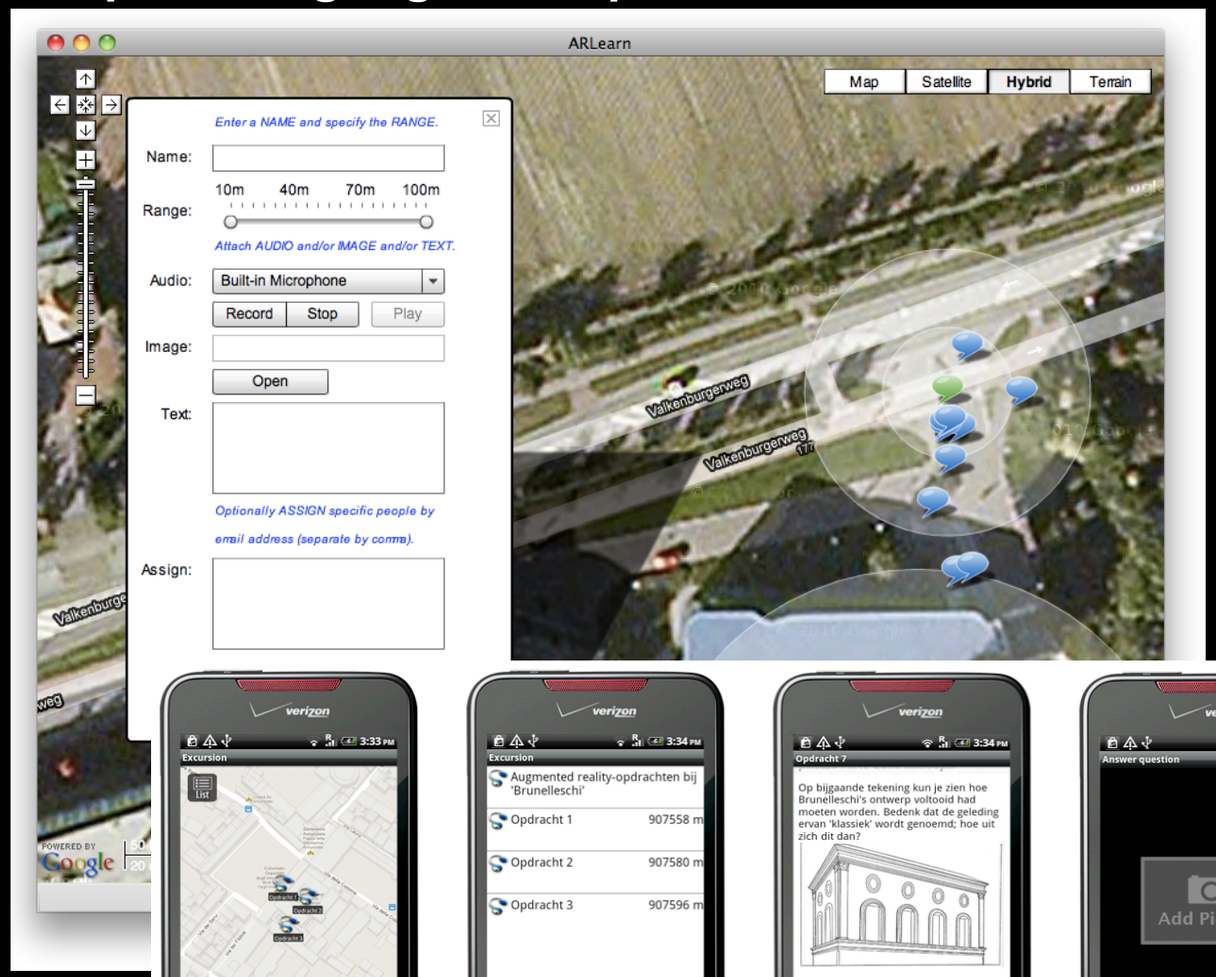


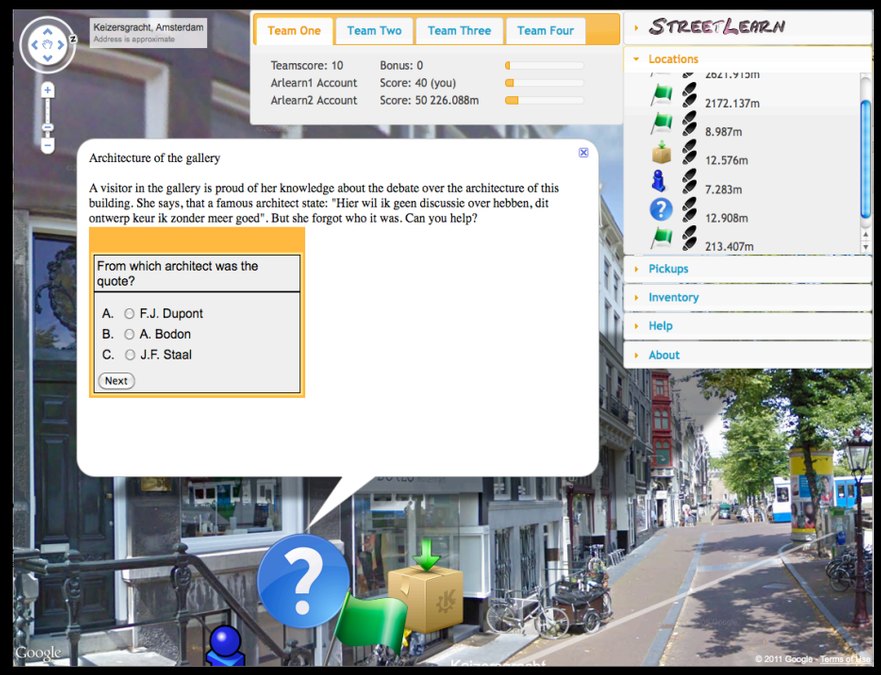
http://vimeo.com/user753267

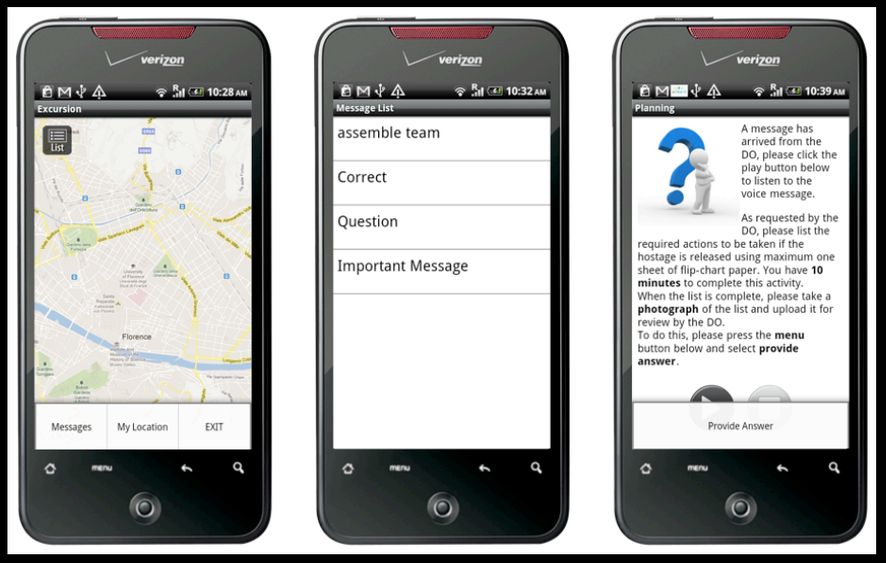
ARLearn Framework, VR and AR

arlearn

http://code.google.com/p/arlearn/





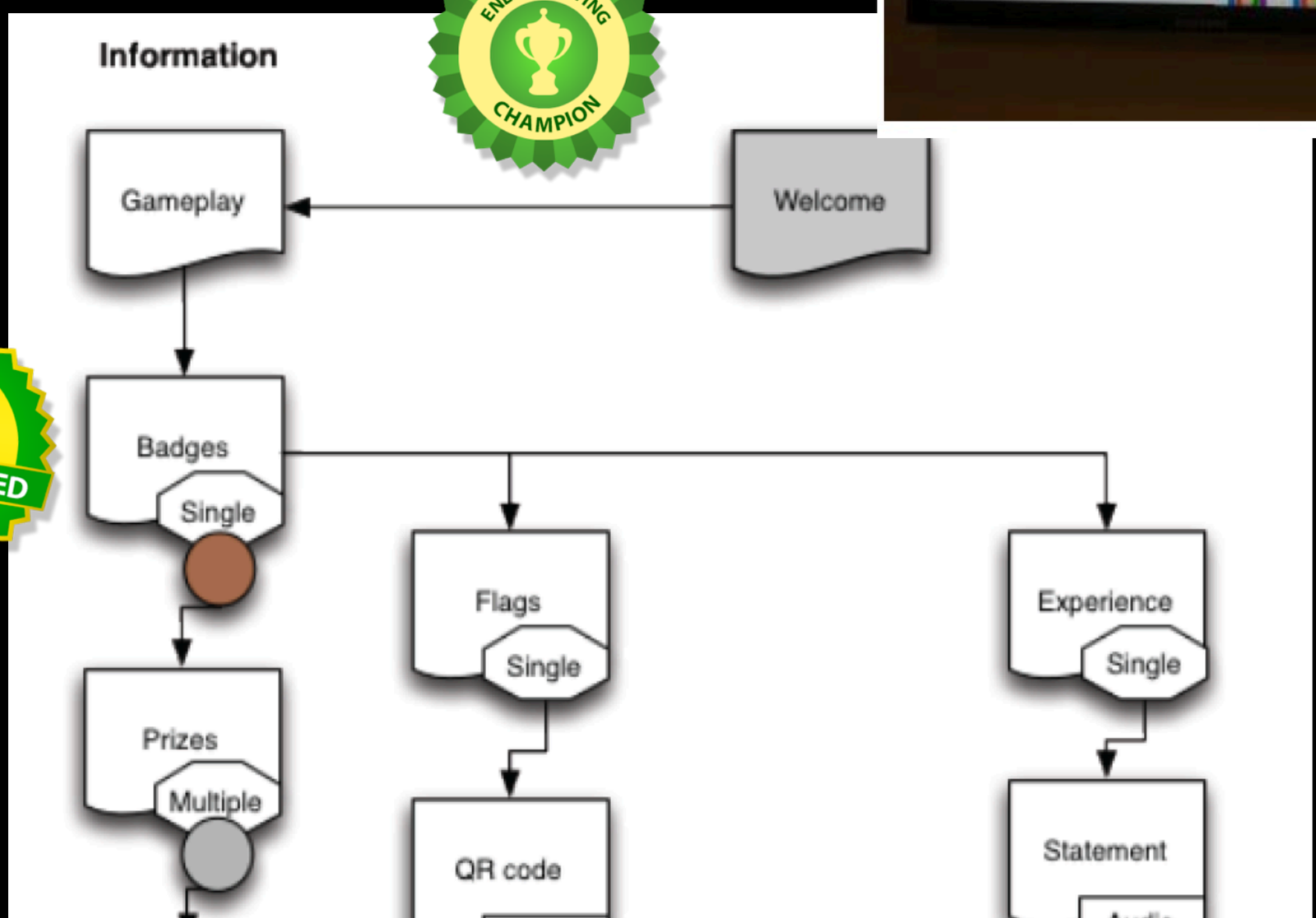


ARLearn, Mozilla Badges, Signage System

arlearn

Mindergie

http://code.google.com/p/arlearn/



Inquiry-Based Learning

- **Challenge 1**: A ***lack of inquiry skills*** in students in the target age range (12-25)
- **Challenge 2**: Students ***curiosity*** is not supported by todays technology and learner's cannot make their **informal learning activities visible in the formal learning**
- **Challenge 3**: Supporting students to construct ***personal conceptual knowledge*** and develop ***creative applications*** of the theory
- **Challenge 4**: ***Linking e-learning support in schools*** with inquiry-based approaches
- **Challenge 5**: How to ***measure impact***?

Evaluations & Testbeds

8 primary test-beds in a European wide approach in 8 European member states

- ***Food***: Investigating materials properties, advanced packaging and misuse of chemicals. Understanding chemical reactions, food chemistry. Bacteria contamination as well as chemical and heat sterilization

- ***Biodiversity***: Understanding of genetic variation. Designing and evaluating breeding programmes. Understanding of intra-animal biological relationships

- ***Earthquake***: Understanding elementary statistics, analysis of results. Elaborating a comparison of earthquakes in terms of size, location, global and/or local distribution and frequency occurrence, mapping and analyzing geospatial information

- ***Sea***: Understanding sea life, substances in the water and/or physics on board

- ***Energy***: Describing speed of chemical processes. Understanding that the current flow energy source gives consumers and describes the effects of thermal appliances. Calculate the cost of electricity by household electrical appliances and finding ways to save it

- ***School***: Identifying and interweave new technologies for learning and teaching. Proposing innovative learning activities, preparing students for new jobs

- ***Innovation***: inquiry on existing technical solutions (patent databases) and preparation of the patent application

- ***Economy***: analysis of data on economic complexity. Interpretation of data and comparison. Assessment of impact for economic and social development

Think Seamless !
Use Context !
Start Local !

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Key questions and issues

- Build on extending existing practices with everyday environments and everyday objects.
- What is the difference with adding ***storage, persistence, communication, multimedia, notifcation, sensing context***?
- What learning goal and how are these linked to existing work processes? What is the educational function we implement via the mobile?
- What is the linkage between the different communication channels and how can we implement this? SOcial LOcal MObile extensions.
- What is the “I am ready to invest for” added value service?